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FEDERAL - STATE - PRIVATE  
COOPERATIVE SNOW SURVEYS

U. S. DEPT. OF AGRICULTURE  
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FEB 26 1966

CURRENT SERIAL RECORDS

**WATER SUPPLY OUTLOOK**  
and  
**FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS**  
for  
**WASHINGTON**

UNITED STATES DEPARTMENT of AGRICULTURE...SOIL CONSERVATION SERVICE,  
and  
DEPARTMENT of CONSERVATION STATE of WASHINGTON

Data included in this report were obtained by the agencies named above in cooperation with the U.S. Forest Service, U.S. Geological Survey, National Park Service, and other Federal, State and private organizations.

||||||| AS OF |||||  
**FEB. 1, 1966**



# UNITED STATES DEPARTMENT OF AGRICULTURE - SOIL CONSERVATION SERVICE

## To Recipients of Water Supply Outlook Reports:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season as they affect runoff will add to be an effective average. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1400 snow courses in Western United States and in the Columbia Basin in British Columbia. In the near future, it is anticipated that automatic snow water equivalent sensing devices along with radio telemetry will provide a continuous record of snow water equivalent at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data or reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

Listed below are water supply outlook reports based on Federal-State-Private Cooperative snow surveys. Those published by the Soil Conservation Service may be obtained from Soil Conservation Service, Room 507, Federal Building, 701 N. W. Glisan, Portland, Oregon 97209.

### PUBLISHED BY SOIL CONSERVATION SERVICE

<u>REPORTS</u>	<u>ISSUED</u>	<u>LOCATION</u>	<u>COOPERATING WITH</u>
<b>RIVER BASINS</b>			
WESTERN UNITED STATES	MONTHLY (FEB.-MAY)	PORTLAND, OREGON	ALL COOPERATORS
BASIC DATA SUMMARY	OCTOBER 1	PORTLAND, OREGON	ALL COOPERATORS
<b>STATES</b>			
ALASKA	MONTHLY (MAR.-MAY)	PALMER, ALASKA	ALASKA S.C.D.
ARIZONA	SEMI-MONTHLY (JAN. 15 - APR. 1)	PHOENIX, ARIZONA	SALT R. VALLEY WATER USERS ASSOC. ARIZ. AGR. EXP. STATION
COLORADO AND NEW MEXICO	MONTHLY (FEB.-MAY)	FORT COLLINS, COLORADO	COLO. STATE UNIVERSITY COLO. STATE ENGINEER N. MEX. STATE ENGINEER
IDAHO	MONTHLY (JAN.-JUNE)	BOISE, IDAHO	IDAHO STATE RECLAMATION ENGINEER
MONTANA	MONTHLY (JAN.-JUNE)	BOZEMAN, MONTANA	MONT. AGR. EXP. STATION
NEVADA	MONTHLY (JAN.-MAY)	RENO, NEVADA	NEVADA DEPT. OF CONSERVATION AND NATURAL RESOURCES - DIVISION OF WATER RESOURCES
OREGON	MONTHLY (JAN.-JUNE)	PORTLAND, OREGON	OREG. STATE UNIVERSITY OREGON STATE ENGINEER
UTAH	MONTHLY (JAN.-JUNE)	SALT LAKE CITY, UTAH	UTAH STATE ENGINEER
WASHINGTON	MONTHLY (FEB.-JUNE)	SPOKANE, WASHINGTON	WN. STATE DEPT. OF CONSERVATION
WYOMING	MONTHLY (FEB.-JUNE)	CASPER, WYOMING	WYOMING STATE ENGINEER

### PUBLISHED BY OTHER AGENCIES

<u>REPORTS</u>	<u>ISSUED</u>	<u>AGENCY</u>
BRITISH COLUMBIA	MONTHLY (FEB.-JUNE)	WATER RESOURCES SERVICE, DEPT. OF LANDS, FOREST AND WATER RESOURCES, PARLIAMENT BLDG., VICTORIA, B.C., CANADA
CALIFORNIA	MONTHLY (FEB.-MAY)	CALIF. DEPT. OF WATER RESOURCES, P.O. Box 388, SACRAMENTO, CALIF.

FEDERAL-STATE-COOPERATIVE  
SNOW SURVEY AND WATER SUPPLY FORECASTS

For

WASHINGTON

Report Prepared  
By

Robert T. Davis, Snow Survey Supervisor

Soil Conservation Service  
840 Bon Marche Building  
Spokane, Washington

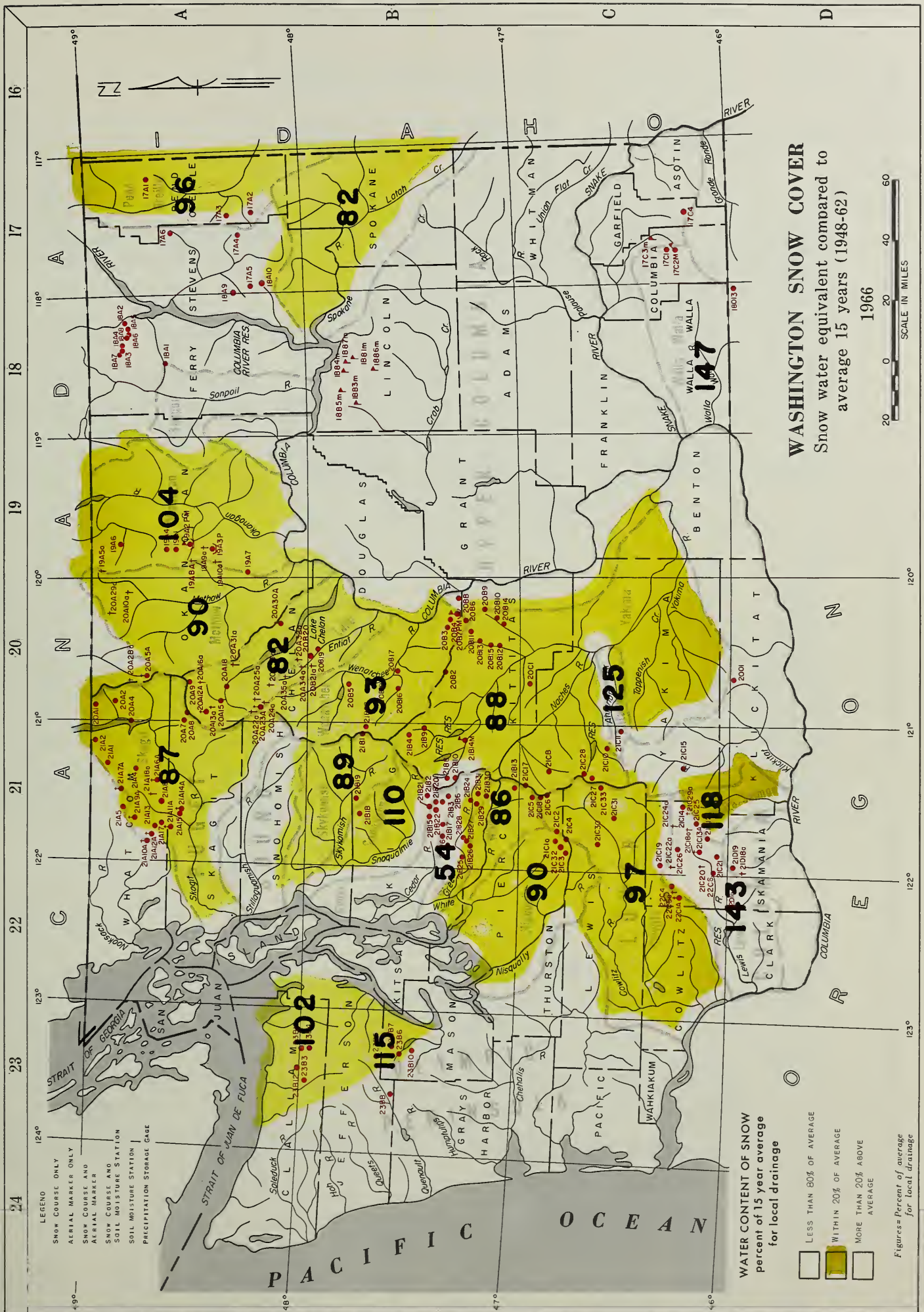
Issued By

Orlo W. Krauter  
State Conservationist  
Soil Conservation Service  
U. S. Department of Agriculture

Murray G. Walker, Supervisor  
Division of Water Resources  
Department of Conservation  
State of Washington









INDEX to WASHINGTON SNOW COURSES, SOIL MOISTURE STATIONS and PRECIPITATION STORAGE GAGES

UPPER COLUMBIA DRAINAGE					LOWER COLUMBIA DRAINAGE					PUGET SOUND DRAINAGE					OLYMPIC PENINSULA				
NAME	NUMBER	SIC	TRP. RANGE	ELEV.	NAME	NUMBER	SIC	TRP. RANGE	ELEV.	NAME	NUMBER	SIC	TRP. RANGE	ELEV.	NAME	NUMBER	SIC	TRP. RANGE	ELEV.
Pend Oreille River					Asotin Creek					Nisqually River					Dungeness River				
Boyer Mountain	17A2	7	31N 43E	5250	Spruce Springs	17C4	9	8N 42E	5700	Ghost Forest	21C4	23	15N 8E	4550	Deer Park	23B4	1	28N 5W	5200
Bunchgrass Meadow	17A1	24	37N 44E	5000		17C3m	2	9N 35E	3370		21C3	29	15N 8E	2760		Morse Creek	23B13	1	28N 5W
Winchester Creek	17A3	30	33N 43E	4970	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	Longmire	21C2	13	15N 8E	5500		Morse Creek	23B12	25	29N 7W
Kettle River					Walla Walla Diversion	18D13	22	6N 38E	2400	Paradise Park	21C1	13	15N 8E	5050	Elwha River				
Boulder Road	18A2	30	39N 36E	1450	Cause	17C3m	2	9N 35E	3370	Trail Creek	21C10	3	12N 13E	6000	Black and White	23B7	17	24N 5W	4200
Butte Creek	18A3	28	39N 35E	4070	Homestead	17C1	11	9N 40E	4030		Green Lake	21C11	29	13N 11E		4500	Black and White Lakes	23B6	16
Cabin Creek	18A4	5	38N 36E	3170	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	High Creek	20B12	34	20N 19E	2950	Four Stream	23B10	1	23N 6W	3000
Cold Creek	18A4	26	39N 35E	3595	Walla Walla Diversion	18D13	22	6N 38E	2400	Lake Cle Elum	21B14M	15	20N 14E	2200	Home Sweet Home	23B5	28	25N 5W	5200
Snow Caps Creek	18A5	3	38N 36E	2150	Cause	17C3m	2	9N 35E	3370	Morse Lake	20C1	24	17N 16E	3935	Sundown Pass	23B8	25	24N 7W	3900
Snow Caps Trail	18A6	5	38N 36E	2730	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	Nanum	20B13	4	20N 19E	3875	Skokomish River				
Summit G. S.	18A7	20	39N 35E	4600	Walla Walla Diversion	18D13	22	6N 38E	2400	Tunnel Avenue	20B14	20	19N 20E	3360	Black and White	23B7	17	24N 5W	4200
Colville River					Cause	17C3m	2	9N 35E	3370	Walters Flat	21B8	13	21N 11E	2450		Black and White Lakes	23B6	16	24N 5W
Baird	17A6	19	36N 42E	3215	Homestead	17C1	11	9N 40E	4030	White Pass (East Side)	20B15	22	20N 19E	3360	Four Stream	23B10	1	23N 6W	3000
Carlson	18A9	34	32N 38E	2885	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	White Pass (Leach Lake)	21C28	2	13N 11E	4500	Home Sweet Home	23B5	28	25N 5W	5200
Chevelah	17A4	11	32N 41E	4925	Walla Walla Diversion	18D13	22	6N 38E	2400		21C27	1	13N 11E	4500	Sundown Pass	23B8	25	24N 7W	3900
Stranger Mountain	17A5	26	31N 38E	4990	Cause	17C3m	2	9N 35E	3370	CEDAR RIVER					Morse Creek				
Togo	18A10	6	29N 38E	3370	Homestead	17C1	11	9N 40E	4030	City Cabin	21B3	10	21N 10E	2390	Hurricane	23B3	36	29N 7W	4500
Sonpoil River					Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400		21B21	30	22N 10E	3300		Skokomish River	23B7	17	24N 5W
Sherman Creek Pass	18A1	10	36N 35E	5350	Walla Walla Diversion	18D13	22	6N 38E	2400	Mt. Gardner	21B22	31	22N 10E	2500	Black and White		23B7	17	24N 5W
Okanogan River					Walla Walla Diversion	18D13	22	6N 38E	2400	Park Creek Flat	21B15	8	22N 9E	3000	Black and White Lakes	23B6	16	24N 5W	4700
Clark	19A8a	2	36N 23E	7000	Cause	17C3m	2	9N 35E	3370		21B17	11	21N 9E	2400	Four Stream	23B10	1	23N 6W	3000
Nucknuck	19A8a	20	36N 24E	6750	Homestead	17C1	11	9N 40E	4030	Stampede Pass	21B30	18	19N 11E	4100	Home Sweet Home	23B5	28	25N 5W	5200
Nutton Creek No. 1	19A1	30	37N 24E	5700	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	Twin Camp	21B30	18	19N 11E	4100	Sundown Pass	23B8	25	24N 7W	3900
Nutton Creek No. 2	19A1	30	37N 24E	6000	Walla Walla Diversion	18D13	22	6N 38E	2400	CEDAR RIVER					Morse Creek				
Paysonien	20A28a	32	40N 18E	4300	Cause	17C3m	2	9N 35E	3370	City Cabin	21B3	10	21N 10E	2390	Hurricane	23B3	36	29N 7W	4500
Rusty Creek	19A3P	18	35N 24E	4000	Homestead	17C1	11	9N 40E	4030	Mt. Gardner	21B21	30	22N 10E	3300		Skokomish River	23B7	17	24N 5W
Salmon Meadows	20A2PM	33	37N 24E	4500	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	Mt. Gardner Aux.	21B22	31	22N 10E	2500	Black and White		23B7	17	24N 5W
Starvation Mtn.	19A10a	15	35N 23E	6750	Walla Walla Diversion	18D13	22	6N 38E	2400	Mt. Lindsey	21B16	31	22N 9E	2500	Black and White Lakes	23B6	16	24N 5W	4700
Tout's Coulee	19A6	30	39N 25E	2845	Walla Walla Diversion	18D13	22	6N 38E	2400	Mt. Washington	21B15	8	22N 9E	3000	Four Stream	23B10	1	23N 6W	3000
Methow River					Cause	17C3m	2	9N 35E	3370	Rex River	21B17	11	21N 9E	2400	Home Sweet Home	23B5	28	25N 5W	5200
Billy Goat Pass	20A10a	10	38N 20E	6400	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	South Fork Cedar	21B6	24	21N 10E	3000	Sundown Pass	23B8	25	24N 7W	3900
Dollar Watch	20A29a	8	39N 20E	7000	Walla Walla Diversion	18D13	22	6N 38E	2400	Tinkham Creek	21B20	1	21N 10E	3400	Skokomish River				
Harts Pass	20A5a	7	37N 18E	6500	Cause	17C3m	2	9N 35E	3370	CEDAR RIVER					Morse Creek				
Horsehoe Basin	19A5a	15	40N 23E	7000	Homestead	17C1	11	9N 40E	4030	City Cabin	21B3	10	21N 10E	2390	Hurricane	23B3	36	29N 7W	4500
Loup Loop	19A7	36	34N 23E	4650	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	Mt. Gardner	21B21	30	22N 10E	3300		Skokomish River	23B7	17	24N 5W
Chelon Lake Basin					Walla Walla Diversion	18D13	22	6N 38E	2400	Mt. Lindsey	21B16	31	22N 9E	2500	Black and White		23B7	17	24N 5W
Bridge Creek	20A15	20	34N 16E	2100	Cause	17C3m	2	9N 35E	3370	Mt. Washington	21B15	8	22N 9E	3000	Black and White Lakes	23B6	16	24N 5W	4700
Bullion	20A18	2	33N 16E	1260	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	Stampede Pass	21B30	18	19N 11E	4100	Four Stream	23B10	1	23N 6W	3000
Cloudy Pass	20A22a	12	31N 15E	6500	Walla Walla Diversion	18D13	22	6N 38E	2400	Twin Camp	21B30	18	19N 11E	4100	Home Sweet Home	23B5	28	25N 5W	5200
Greenwood Flat	20A25a	3	31N 16E	3540	Cause	17C3m	2	9N 35E	3370	CEDAR RIVER					Morse Creek				
Little Meadows	20A24a	8	31N 16E	5275	Homestead	17C1	11	9N 40E	4030	City Cabin	21B3	10	21N 10E	2390	Hurricane	23B3	36	29N 7W	4500
Lyman Lake	20A23a	18	31N 16E	5900	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	Mt. Gardner	21B21	30	22N 10E	3300		Skokomish River	23B7	17	24N 5W
Park Creek Flat	20A13a	18	34N 16E	2220	Walla Walla Diversion	18D13	22	6N 38E	2400	Mt. Gardner Aux.	21B22	31	22N 10E	2500	Black and White		23B7	17	24N 5W
Park Creek Ridge	20A12a	7	34N 16E	4600	Cause	17C3m	2	9N 35E	3370	Rex River	21B15	8	22N 9E	3000	Black and White Lakes	23B6	16	24N 5W	4700
Petersons	20A16a	3	34N 17E	3730	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	South Fork Cedar	21B6	24	21N 10E	3000	Four Stream	23B10	1	23N 6W	3000
Rainy Pass	20A19	21	35N 17E	4780	Walla Walla Diversion	18D13	22	6N 38E	2400	Tinkham Creek	21B20	1	21N 10E	3400	Home Sweet Home	23B5	28	25N 5W	5200
Safety Harbor	20A30a	32	31N 20E	6300	Cause	17C3m	2	9N 35E	3370	CEDAR RIVER					Morse Creek				
War Creek Pass	20A31a	34	33N 18E	6500	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	City Cabin	21B3	10	21N 10E	2390	Hurricane	23B3	36	29N 7W	4500
Entiat River					Walla Walla Diversion	18D13	22	6N 38E	2400	Mt. Gardner	21B21	30	22N 10E	3300		Skokomish River	23B7	17	24N 5W
Brief	20B19	34	28N 19E	1600	Cause	17C3m	2	9N 35E	3370	Mt. Gardner Aux.	21B22	31	22N 10E	2500	Black and White		23B7	17	24N 5W
Entiat Meadows	20A33a	28	31N 17E	4800	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	Mt. Lindsey	21B16	31	22N 9E	2500	Black and White Lakes	23B6	16	24N 5W	4700
Entiat River Trail	20A34a	2	29N 17E	3150	Walla Walla Diversion	18D13	22	6N 38E	2400	Mt. Washington	21B15	8	22N 9E	3000	Four Stream	23B10	1	23N 6W	3000
Pope Ridge	20B20	22	29N 18E	4300	Cause	17C3m	2	9N 35E	3370	Rex River	21B17	11	21N 9E	2400	Home Sweet Home	23B5	28	25N 5W	5200
Pugh Ridge	20A32a	34	30N 18E	6400	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	South Fork Cedar	21B6	24	21N 10E	3000	Sundown Pass	23B8	25	24N 7W	3900
Snow Brushy	20A35a	21	30N 17E	3850	Walla Walla Diversion	18D13	22	6N 38E	2400	Tinkham Creek	21B20	1	21N 10E	3400	Skokomish River				
Tommy Creek	20B21a	10	28N 18E	5300	Cause	17C3m	2	9N 35E	3370	CEDAR RIVER					Morse Creek				
Wenatchee River					Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	City Cabin	21B3	10	21N 10E	2390	Hurricane	23B3	36	29N 7W	4500
Berne-Hill Creek	21B23	7	26N 15E	2925	Walla Walla Diversion	18D13	22	6N 38E	2400	Mt. Gardner	21B21	30	22N 10E	3300		Skokomish River	23B7	17	24N 5W
Blewett Pass No. 2	20B2	35	22N 17E	4270	Cause	17C3m	2	9N 35E	3370	Mt. Gardner Aux.	21B22	31	22N 10E	2500	Black and White		23B7	17	24N 5W
Chiwaukum G. S.	20B16	4	25N 17E	1810	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	Rex River	21B15	8	22N 9E	3000	Black and White Lakes	23B6	16	24N 5W	4700
Lake Wenatchee	20B5	33	27N 17E	1970	Walla Walla Diversion	18D13	22	6N 38E	2400	South Fork Cedar	21B6	24	21N 10E	3000	Four Stream	23B10	1	23N 6W	3000
Leavenworth R. S.	20B17	1	24N 17E	1127	Cause	17C3m	2	9N 35E	3370	Tinkham Creek	21B20	1	21N 10E	3400	Home Sweet Home	23B5	28	25N 5W	5200
Herriott	20B18	4	26N 16E	2140	Martin Springs (Helmets SW)	17C2M	23	9N 40E	4400	CEDAR RIVER					Morse Creek				
Stevens Pass	21B1	14	26N 13E	4070	Walla Walla Diversion	18D13	22	6N 38E	2400	City Cabin	21B3	10	21N 10E	2390	Hurricane	23B3	36	29N 7W	4500
					Cause	17C3m	2	9N 35E	3370	Mt. Gardner	21B21	30	22N 10E	3300		Skokomish River	23B7	17	24N 5W

LEGEND  
NUMBERING SYSTEM EXAMPLE  
21A7 SNOW COURSE ONLY  
21A7a AERIAL MARKER ONLY  
21A7A SNOW COURSE AND AERIAL MARKER  
21A7M SNOW COURSE AND SOIL MOISTURE STATION  
21A7m SOIL MOISTURE STATION  
21A7P SNOW COURSE AND PRECIPITATION STORAGE GAGE  
21A7p PRECIPITATION STORAGE GAGE



## WATER SUPPLY OUTLOOK

State of Washington  
February 1, 1966

\*\*\*\*\*  
\* The water supply outlook for irrigation and power for the Columbia \*  
\* Basin in Washington and its tributary streams can be considered good \*  
\* for this time of year. Snow surveys made in the state and adjacent \*  
\* areas near the first of February show a snowpack that varies from a \*  
\* low of 54% of normal to a high of 148%. Most of the courses that \*  
\* were measured along the Cascade divide indicate a snowpack that is \*  
\* below normal in the upper elevations, well above normal in the low \*  
\* elevations and slightly above in the middle. Watershed soil mantles \*  
\* generally have less water in storage than occurred during the last \*  
\* two years and only half of their capacity. Reservoirs as of the end \*  
\* of January generally have below normal amounts of water in storage \*  
\* but most should comfortably fill with the spring runoff. \*  
\*\*\*\*\*

### SNOW COVER

Most of the watershed in the Upper Columbia Basin of Washington has a snowpack that is very near normal for this time year. The snow courses at high elevations where only one course is used for comparison purposes reduces the percentage down as low as 82%. In opposition, the one course measured in the Ahtanum watershed, at a relatively low elevation, has a snowpack that is 25% above normal. Along the lower Columbia, snowpacks are generally better. Mill Creek, again low elevation, has a snow cover of 44% above normal and Cowlitz, generally based on high elevation courses, only 97%. The Puget Sound drainage basin area varies from a high of 90% to a low of 54%. Again this change of elevation with respect to snow cover is the factor for this broad difference of percentages.

### RESERVOIRS

All of the reservoirs in the Columbia Basin in Washington and immediate vicinity have below normal amounts of water in storage as of February 1 with the exception of two on the Skagit River. While most of these reservoirs are abnormally low it is doubtful whether there will be any stored water shortages for irrigation use. The large reservoirs, such as Franklin D. Roosevelt Lake, Chelan Lake and Coeur d'Alene Lake will all comfortably fill with the spring runoff. The five reservoirs in the Yakima drainage should fill with the spring runoff. While there is a possibility that all reservoirs will not completely fill, sufficient water will be available for this year's irrigation needs with a possibility of a small carry-over for 1967. Two reservoirs in the Okanogan drainage, Conconully Reservoir and Salmon Lake, are not expected to





fill under present snow runoff conditions. Conconully Reservoir, which has been drained for repair work, will need 13,000 acre feet to fill it, let alone that which is needed for irrigation and domestic water supplies. Skagit River reservoir will fill and spill with the spring runoff.

#### PRECIPITATION

Fall precipitation for all ten drainage divisions was well below normal. Divisions reported precipitation of down to 40% of normal for the months of September, October and November. December precipitation was somewhat a continuation of this condition with only above normal precipitations occurring in the Columbia River area in Canada and some from the Methow and Okanogan drainages in Washington. During the month of January above normal precipitation only happened in the Pend Oreille and Spokane drainages, on the west slopes of the Cascades and the lower Columbia in Oregon.

#### SOIL MOISTURE

There are now eleven soil moisture stations that are used for reporting soil mantle wetness. The five stations in the Crab Creek area in central Washington, have a soil moisture content that averages 44% of capacity, 89% of last year and 96% of 1964. The one station in the Okanogan area in British Columbia is only 48% of capacity, 88% of 1965 and 83% of 1964. The two stations in the Yakima drainage are 69% of capacity, 98% of last year and 5% greater than that which occurred in 1964. Again, two courses in the Walla Walla drainage are 61% of capacity and 65% of last year at this time. In the Wenatchee watershed, a new station has a soil moisture content that is 63% of capacity but 111% of last year.

#### STREAMFLOW

Forecasts of streamflows are made only for the main stem of the Columbia River. These forecasts for the April-September period are for flows at Birchbank 17% above normal, Grand Coulee 4% above, below Rock Island Dam 3% above and at The Dalles 1% above. Numerical forecasts of other streams are not made by the Soil Conservation Service until the March 1 report when a more thorough analysis of the snowpack conditions and how they relate to valley precipitation and other data can be made.





# COMPARISON OF SNOW COVER WITH THAT OF PREVIOUS YEARS

The following tabulation of Washington stream basins presents the water content of the snow about February 1, 1966, as per cent of the same date in 1965 and 1964 and average of record.

Tributary Basin	No. of Courses Average	Years of Record	1966 1965	Snow Water Expressed as per cent of 1964	1948-1962 Avg.
<u>UPPER COLUMBIA BASIN</u>					
Pend Oreille	5 - 8	2 - 29	84	89	96*
Kettle	3 - 11	3 - 26	72	91	106*
Colville	5	4 - 7	81	105	--
Spokane	1 - 8	2 - 21	73	85	82
Okanogan	17 - 21	1 - 28	95	93	104*
Methow	5 - 6	7 - 22	85	83	90*
Chelan	1	12	84	86	82*
Entiat	1	5	79	91	--
Wenatchee	2 - 7	5 - 21	70	72	93*
Yakima	10 - 12	7 - 44	74	74	88*
Ahtanum	1	24	80	172	125*
<u>LOWER COLUMBIA</u>					
Mill Creek	3	12	105	98	147*
Klickitat	2	8 - 9	97	179	--
White Salmon	2	8	89	94	118*
Lewis	3 - 17	3 - 8	100	108	143*
Cowlitz	3 - 8	2 - 14	81	85	97*
<u>PUGET SOUND</u>					
Nisqually	3	9	74	71	90*
White	2	10 - 14	78	67	86*
Green	1 - 9	4 - 19	75	71	54*
Snoqualmie	1	16	73	72	110*
Skykomish	1	21	70	64	89
Skagit	4 - 5	9 - 16	91	74	87*
Nooksack	1	9	96	66	--
<u>OLYMPIC PENINSULA</u>					
Skokomish	1 - 5	2 - 8	107	82	115*
Elwha	1	6	90	64	--*
Dungeness	1	12	122	124	102*

\* Records of less than 15 years used in computation of average





# RESERVOIR STORAGE - 1000 Acre Feet

BASIN or STREAM	<u>1/</u> RESERVOIR	USABLE CAPACITY	1966	Measured (February ) 1965	1964	Normal*
<u>COLUMBIA</u>						
Spokane	Coeur d'Alene Lake	225.1	53.8	237.5	104.7	131.0
Columbia	Franklin D. Roosevelt	5232.0	3170.0	4427.0	4118.0	4059.3
Columbia	Banks Lake <u>2/</u>	761.8	506.1	447.6	354.4	484.3
Okanogan	Conconully Reservoir	13.0	0	4.7	3.8	7.0
Okanogan	Salmon Lake	10.5	7.8	8.4	9.5	8.9
Chelan	Lake Chelan	676.1	272.0	334.0	317.6	341.0
<u>YAKIMA</u>						
Yakima	Keechelus Lake	157.8	76.4	104.6	56.8	87.4
Kachess	Kachess Lake	239.0	162.8	191.3	132.9	171.9
Cle Elum	Lake Cle Elum	436.9	186.4	307.1	140.4	240.9
Bumping	Bumping Lake	33.7	3.2	10.8	7.5	10.4
Tieton	Rimrock Lake	198.0	82.4	153.9	84.2	113.0
<u>PUGET SOUND</u>						
Skagit	Ross Reservoir <u>2/</u>	1202.9	867.9	916.5	1162.2	766.9
Skagit	Diablo Reservoir	90.6	85.9	82.9	83.8	85.7
Skagit	Gorge Reservoir	9.8	7.4	7.5	7.7	--

1/ Based on Active Storage

2/ Less than 15-year record in period 1948-62

\* 15-year average 1948-62



# SOIL MOISTURE - FEBRUARY

Drainage Basin and Station	Number	Elev.	Profile (Inches) : Soil Moisture Content				
			Depth	Total Capacity	: (Inches) as of Feb. 1		
					1966	1965	1964
<u>CRAB CREEK</u>							
Creston-Kunz	18B1m	2440	48	13.6	5.3	7.7	6.7
Jack Woods	18B3m	2600	48	13.6	7.0	6.7	8.4
Krause	18B4m	2440	48	13.6	6.9	7.4	6.4
Sheffels	18B5m	2360	48	13.6	5.1	5.8	5.0
Wheatridge	18B6m	2200	48	13.6	5.9	6.6	5.5
<u>OKANOGAN</u>							
Trout Creek	3-M	3600	48	7.3	3.5*	4.0	4.2
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	4.4*	4.9	--
Lake Cle Elum	21B14M	2200	48	12.8	9.5*	9.0	9.0
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	7.2	10.1	7.0*
Helmrs	17C2M	4400	48	12.0	6.8	11.5	8.5
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	8.0	7.2	--

\* January 1 measurement

# FALL SOIL MOISTURE

Drainage Basin and Station	Number	Elev.	Profile (Inches) : Soil Moisture Content				
			Depth	Total Capacity	: (Inches) as of Oct. 1		
					1965	1964	1963
<u>CRAB CREEK</u>							
Creston-Kunz	18B1m	2440	48	13.6	4.9	5.4	5.1
Jack Woods	18B3m	2600	48	13.6	5.0	4.4	6.3
Krause	18B4m	2440	48	13.6	5.8	5.9	5.2
Sheffels	18B5m	2360	48	13.6	4.0	3.7	3.7
Wheatridge	18B6m	2200	48	13.6	4.2	4.1	4.5
<u>OKANOGAN</u>							
Trout Creek	3-M	3600	48	7.3	4.1	4.9	4.1
<u>YAKIMA</u>							
Domery Flat	21B20m	2200	48	6.9	1.9	4.4	--
Lake Cle Elum	21B14M	2200	48	12.8	6.9	8.5	6.6
<u>WALLA WALLA</u>							
Couse	17C3m	3650	48	11.1	6.0	5.6	5.7
Helmrs	17C2M	4400	48	12.0	6.2	6.0	5.8
<u>WENATCHEE</u>							
Upper Wheeler	20B7M	4400	48	12.7	6.2	5.3	--





# PRECIPITATION <sup>1/</sup>

## Division Averages and Departures

DRAINAGE DIVISIONS	FALL		WINTER	
	Sept-Oct-Nov. 1965 <sup>2/</sup>	Departure	Dec. 1965 & Jan. 1966 <sup>2/</sup>	Departure
	Average		Average	
Columbia in Canada	6.01	- 0.36	8.21	+ 1.93
Pend Oreille - Spokane	5.44	- 3.50	6.83	- 1.72
Northeastern Washington	3.31	- 2.00	4.35	- 0.85
Southeastern Washington	2.84	- 3.03	4.26	- 1.41
Central Washington	5.55	- 6.32	12.82	- 2.52
North Central Washington	1.65	- 1.38	3.23	- 0.10
Northwest Slope Cascades	16.93	- 8.11	21.61	- 1.77
Southwest Slope Cascades	11.21	- 6.88	18.50	+ 0.03
Blue Mountains, Oregon	2.49	- 2.23	3.03	- 1.97
Lower Columbia in Oregon	3.23	- 1.17	5.11	- 0.71

Northeastern Washington - Lower Spokane, Colville, Sanpoil and lower Kettle drainages

Southeastern Washington - Touchet, Tucannon and Palouse drainages

Central Washington - Yakima, Wenatchee and Chelan drainages

North Central Washington - Methow and Okanogan drainages

Northwest Slope Cascades - Puget Sound drainages

Southwest Slope Cascades - Lower Columbia drainages

<sup>1/</sup> - Preliminary analysis by U. S. Weather Bureau from data furnished by Meteorological Services of Canada and U. S. Weather Bureau

<sup>2/</sup> - Departure from 13-year (1948-62) drainage division average

Note - Precipitation shown in inches

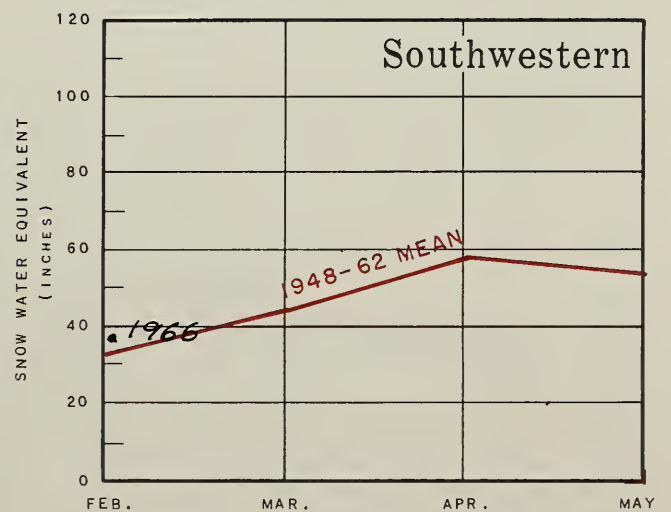
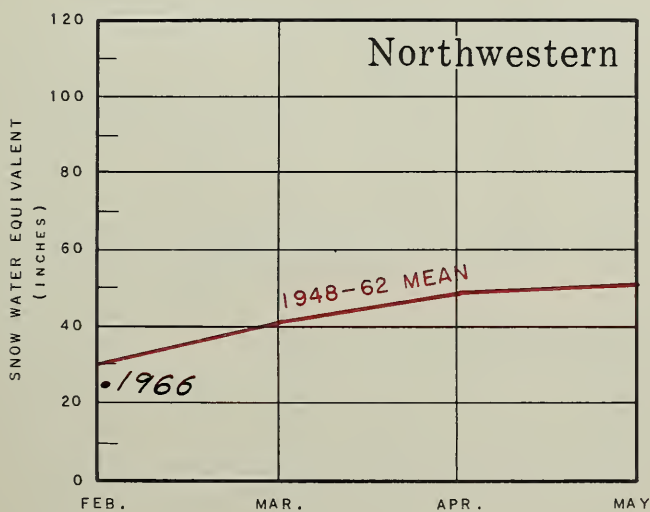
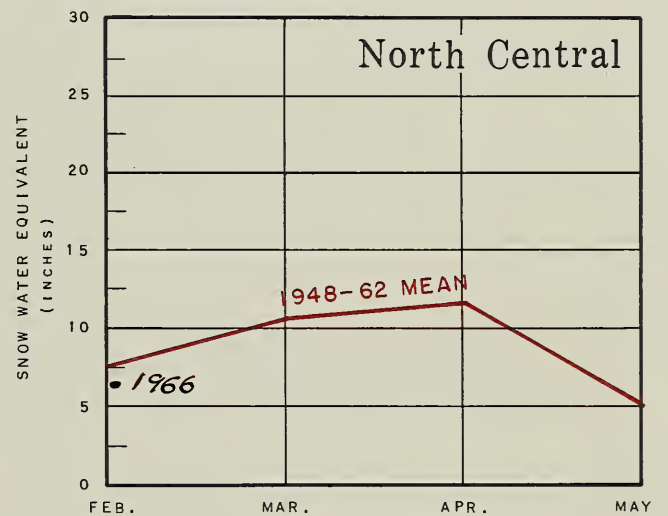
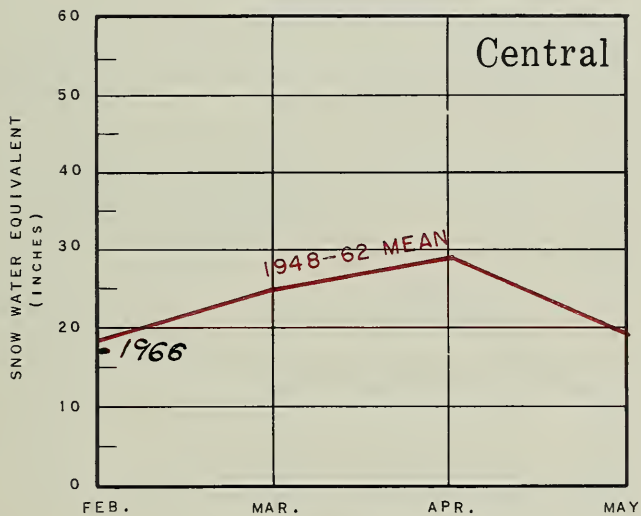
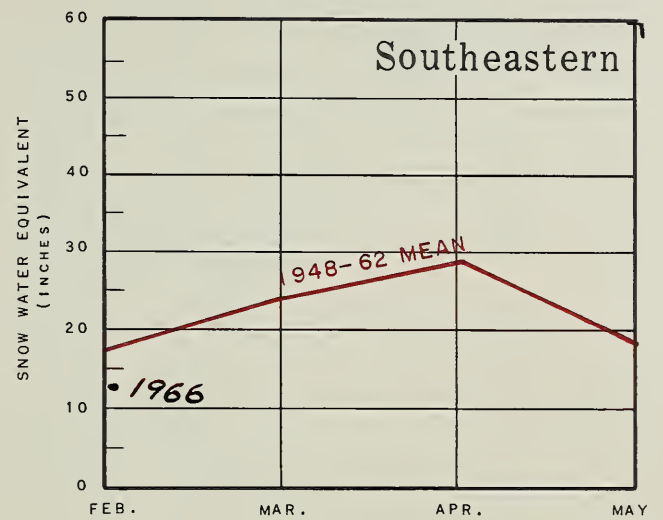
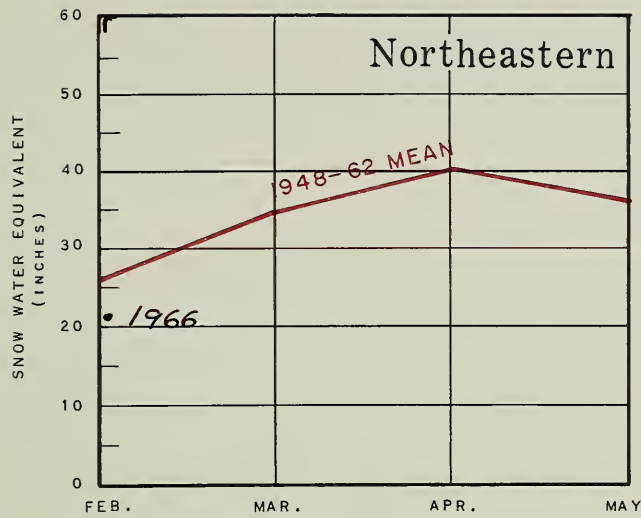




# WASHINGTON SNOW COVER

1966

## DRAINAGE AREAS

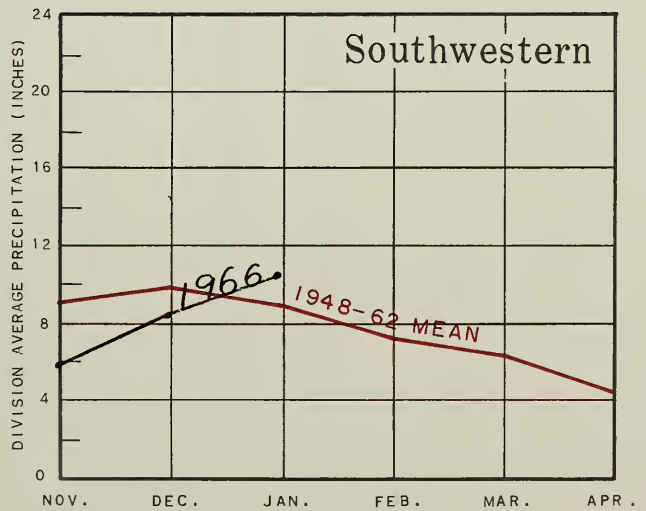
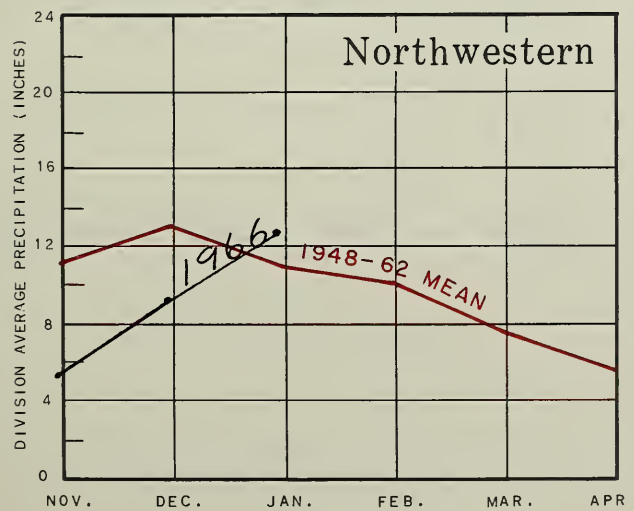
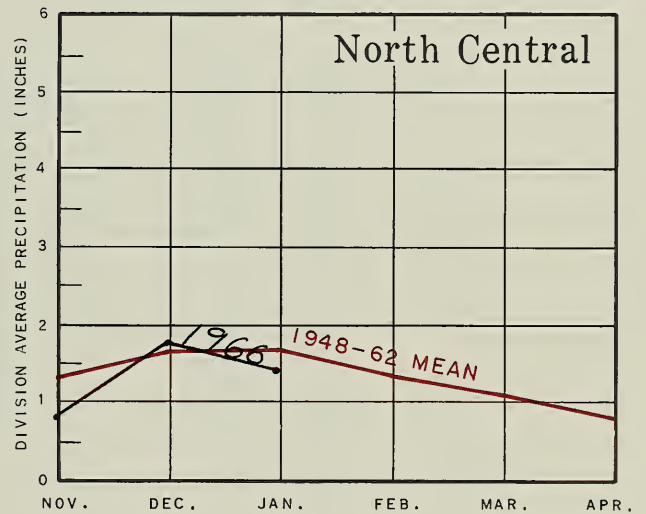
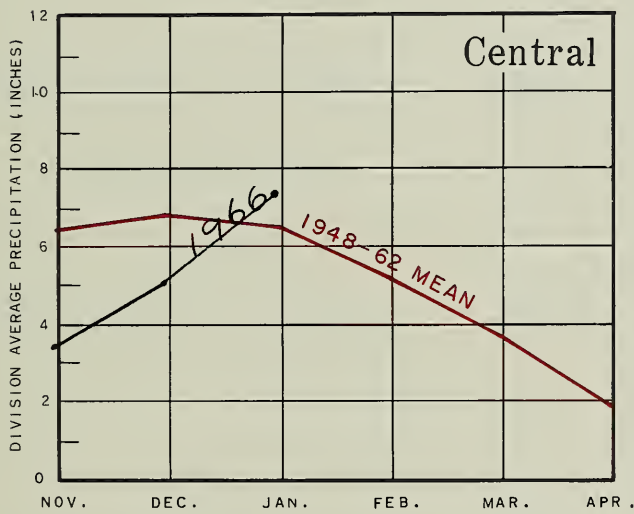
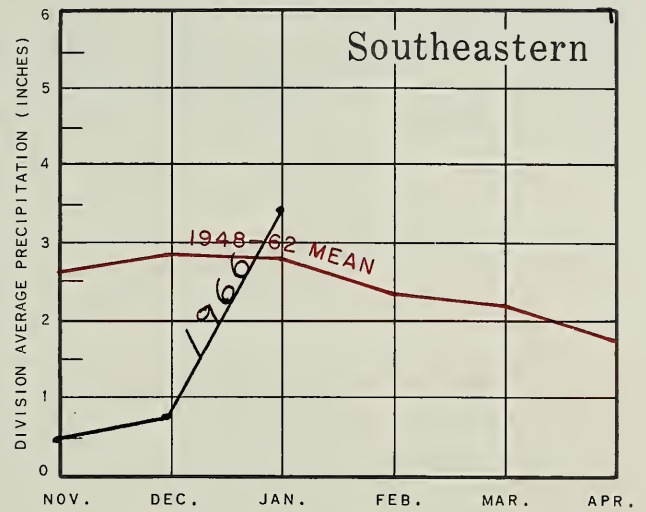
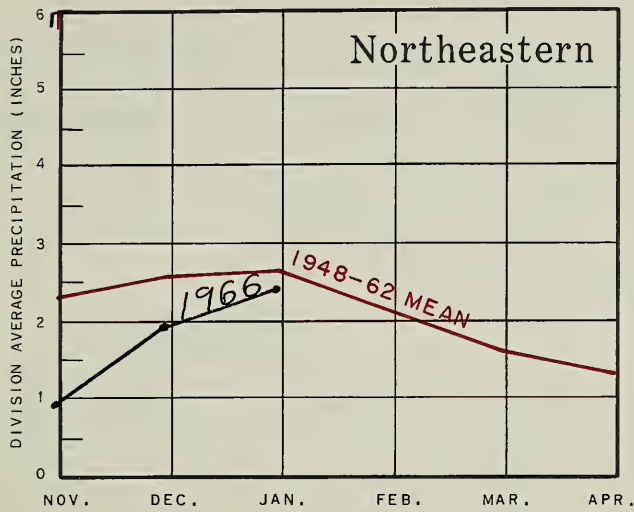




# WASHINGTON VALLEY PRECIPITATION

1965 - 1966

## DRAINAGE AREAS







## APPENDIX 1

## SNOW DATA FEBRUARY 1, 1966

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1966		:P a s t R e c o r d			
			Date of Survey	Snow Depth (In.)	Water : Content: (In.)	Water Content (In.)	1948-62	
						:1965	1964	Avg.

## Snow Surveys Made Prior to February 1, 1966

U P P E R C O L U M B I A D R A I N A G EKETTLE RIVER

Boulder Road	18A2	1450	10/25	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.0	0.0	--
			11/24	0	0.0	0.0	0.0	--
			12/14	0	0.0	0.9	1.0	--
			1/3	23	3.4	3.0	2.7	--
			1/17	19	4.4	6.9	2.8	--
Butte Creek	18A3	4070	10/25	0	0.0	0.0	0.0	--
			11/10	0	0.0	1.2	1.4	--
			11/24	3	0.6	1.3	1.9	--
			12/14	5	1.7	3.1	2.9	--
			1/3	27	4.0	5.5	3.4	--
			1/17	24	5.5	9.1	4.4	--
Cabin Creek	18A8	3170	10/25	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.5	1.3	--
			11/24	0	0.0	0.0	1.0	--
			12/14	5	1.0	3.1	2.1	--
			1/3	27	3.5	5.1	4.1	--
			1/17	22	5.0	8.2	4.2	--
Goat Creek	18A4	3595	10/25	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.5	1.0	--
			11/24	0	0.0	0.6	1.2	--
			12/14	3	0.6	2.6	1.9	--
			1/3	24	3.5	4.7	3.3	--
			1/17	21	4.7	7.3	3.8	--
Snow Caps Creek	18A5	2150	10/25	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.0	0.0	--
			11/24	0	0.0	0.0	0.0	--
			12/14	0	0.0	1.3	0.8	--
			1/3	21	3.0	3.3	2.8	--
			1/17	18	4.3	6.8	2.8	--





## APPENDIX 2

DRAINAGE and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1966		: P a s t R e c o r d			
			Date of Survey	Snow Depth (in.)	Water Content: (In.)	Water Content: 1965	Water Content: 1964	(In.) 1948-62 Avg.

Snow Surveys Made Prior to February 1, 1966 (Cont.)

KETTLE RIVER (Cont.)

Snow Caps Trail	18A6	2150	10/25	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.0	0.0	--
			11/24	0	0.0	0.0	1.1	--
			12/14	2	0.5	1.9	1.8	--
			1/3	22	3.1	4.1	3.1	--
			1/17	20	4.4	6.6	3.5	--
Summit G. S.	18A7	4600	10/25	0	0.0	0.0	0.0	--
			11/10	0	0.0	0.8	1.4	--
			11/24	3	0.8	1.2	1.9	--
			12/14	6	2.1	3.1	2.8	--
			1/3	23	3.6	5.0	3.9	--
			1/17	22	5.4	7.8	4.4	--

WENATCHEE RIVER

Berne-Mill Creek	21B23	2925	10/26	0	0.0	0.0	0.0	--
			11/12	0	0.0	1.0	0.8	--
			11/29	9	1.4	4.8	2.1	--
			12/14	11	2.0	9.8	3.5	--
			12/30	35	5.0	14.8	8.6	--
			1/13	53	15.1	19.7	18.0	--
Blewett Pass No.2	20B2	4270	1/3	40	7.6	9.6	4.6	8.1*
Chiwaukum G. S.	20B16	1810	10/26	0	0.0	0.0	0.0	--
			11/12	0	0.0	0.6	0.0	--
			11/29	2	0.2	1.6	0.4	--
			12/13	2	0.4	3.7	1.4	--
			12/30	23	2.3	7.8	3.6	--
			1/13	37	7.8	10.9	4.5	--
Lake Wenatchee	20B5	1970	10/26	0	0.0	0.0	0.0	--
			11/12	0	0.0	0.0	0.0	--
			11/29	4	0.6	1.3	0.1	--
			12/13	4	1.1	4.6	1.4	--
			12/30	23	3.1	8.5	4.8	--
			1/13	38	9.9	12.4	6.9	--

\* Adjusted 1948-62 average



## APPENDIX 3

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT					
			1966		: P a s t R e c o r d			
			Date of Survey	Snow Depth (In.)	Water Content: (In.)	Water Content: (In.)	1948-62	

Snow Surveys Made Prior to February 1, 1966 (Cont.)

WENATCHEE RIVER (Cont.)

Leavenworth R. S.	21B17	1127	10/26	0	0.0	0.0	0.0	--
			11/26	2	0.5	0.0	0.0	--
			12/15	0	0.0	0.5	1.0	--
			12/28	25	3.0	4.2	3.0	--
			1/13	30	7.3	6.1	2.6	--
Merritt	20B18	2140	11/12	0	0.0	0.0	0.0	--
			11/29	3	0.5	2.2	0.7	--
			12/13	7	2.0	6.3	2.1	--
			12/30	26	4.2	11.5	5.9	--
			1/13	44	12.0	16.8	9.7	--
Stevens Pass	21B1	4070	10/26	0	0.0	0.0	4.0	--
			11/12	0	0.0	1.8	7.5	--
			11/29	23	4.4	6.9	12.0	11.6*
			12/14	24	7.8	15.6	16.8	15.2*
			12/30	66	13.2	34.1	24.0	21.8*
			1/13	96	28.5	34.6	30.8	27.5*

YAKIMA RIVER

Ahtanum R. S.	21C11	3100	12/27	27	3.3	5.8	2.2	4.3*
#Blewett Pass No.2	20B2	4270	1/3	40	7.6	9.6	4.6	8.1*
Bumping Lake	21C8	3450	11/30	4	0.6	2.4	0.0	4.6*
			12/29	47	6.4	9.9	4.8	7.8
			1/14	49	14.2	15.4	8.4	--
Lake Cle Elum	21B14M	2200	12/29	14	2.0	8.0	4.6	4.9
			1/15	22	7.8	9.7	8.4	--
#Stampede Pass	21B10	3000	11/1	0	0.0	0.0	2.7	--
			11/15	0	0.0	1.1	5.5	--
			11/30	19	2.2	5.2	10.1	--
			12/14	12	3.4	12.1	13.9	--
			1/7	81	12.1	19.1	17.2	20.7*
			1/18	81	16.7	23.7	26.0	25.1*

\* Adjusted 1948-62 average

# Not located directly on this drainage





## APPENDIX 4

				SNOW COVER MEASUREMENT				
				1966	: P a s t   R e c o r d			
DRAINAGE BASIN and SNOW COURSE	No.	Elev.	Date of Survey	Snow Depth (In.)	Water Content: (In.)	Water Content: (In.)	Water Content: (In.)	1948-62 Avg.
					:1965	1964		

## Snow Surveys Made Prior to February 1, 1966 (Cont.)

YAKIMA RIVER (Cont.)

Tunnel Avenue	21B8	2450	11/15	0	0.0	0.0	0.0	--
			12/29	30	5.1	14.5	8.5	10.0
			1/14	48	16.4	20.5	13.6	--
White Pass (E Side)	21C28	4500	11/30	7	1.4	--	--	--
			1/11	48	13.4	18.7	12.2	--
White Pass (Leech L)	21C27	4500	1/4	65	11.8	18.8	11.7	--

AHTANUM CREEK

Ahtanum R. S.	21C11	3100	12/27	27	3.3	5.8	2.2	4.3*
---------------	-------	------	-------	----	-----	-----	-----	------

LOWER COLUMBIA DRAINAGEMILL CREEK

Walla Walla Div.	18D13	2400	12/26	0	0.0	1.0	0.0	0.0*
------------------	-------	------	-------	---	-----	-----	-----	------

WHITE SALMON RIVER

Cultus Creek	21C12	4000	Not measured			20.1	14.8	17.1*
#Surprise Lakes +	21C13A	4250	1/1	95	23.8	22.7	19.3	21.0*

LEWIS RIVER

Blue Lake +	21C22a	4800	1/1	164	41.0	--	34.2	--
Bob's Trail	21C21	2200	1/7	51	16.6	9.9	0.0	--
Calamity Ridge +	22D1a	2500	1/1	34	7.8	--	2.3	--
Council Pass +	21C18a	4200	1/1	87	21.8	--	18.6	--
Divide Meadow +	21C29a	5600	1/1	95	24.7	--	22.9	--
Grand Meadow	21C25	3500	1/3	79	15.1	14.2	5.4	--
Marble Mountain +	22C5a	3200	1/1	63	16.7	--	9.3	--
#Mosquito Meadows	21C19	4100	1/6	110	28.7	--	--	--
New Muddy River	22C3	1400	12/28	38	7.2	13.5	0.0	--
Smith Creek Road	22C4	2100	12/28	54	11.0	22.7	0.0	--
Spencer Meadow +	21C20a	3400	1/1	80	19.2	--	10.4	9.4*
Surprise Lakes +	21C13A	4250	1/1	95	23.8	22.7	19.3	21.0*

\* Adjusted 1948-62 average

# Not directly on this drainage

+ Snow water equivalent estimated from aerial stadia observation





## APPENDIX 5

				SNOW COVER MEASUREMENT				
				1966	: P a s t R e c o r d			
DRAINAGE BASIN and SNOW COURSE	No.	Elev.	Date of Survey	Snow Depth (In.)	Water: Content: (In.):	1965	1964	1948-62 Avg.

## Snow Surveys Made Prior to February 1, 1966 (Cont.)

LEWIS RIVER (Cont.)

Table Mountain +	21C24a	4200	1/1	102	25.5	--	22.3	--
Timbered Peak +	21D18a	3000	1/1	59	14.3	--	9.0	--

COWLITZ RIVER

Cayuse Pass	21C6	5300	1/1	115	25.6	--	--	--
Mosquito Meadows	21C19	4100	1/6	110	28.7	--	--	--
Packwood Lake	21C31	4100	1/7	33	9.5	--	--	--
Pigtail Peak	21C33	5900	1/1	118	26.7	37.0	24.4	--
#White Pass (E Side)	21C28	4500	11/30	7	1.4	--	--	--
			1/11	48	13.4	18.7	12.2	--
#White Pass (Leech L)	21C27	4500	1/4	65	11.8	18.8	11.7	--

P U G E T S O U N D D R A I N A G ENISQUALLY RIVER

Ghost Forest	21C4	4550	12/29	61	12.1	--	--	--
Longmire	21C3	2760	12/29	15	2.0	--	--	--
New Paradise Park	21C2	5500	12/29	79	18.4	--	--	--
Stem Glade	21C1	5050	12/29	81	17.4	--	--	--

GREEN RIVER

Airstrip	21B24	1800	12/31	15	2.2	4.9	0.0	--
Charley Creek	21B25	1200	12/30	18	3.1	4.1	0.0	--
Grass Mtn No. 1	21B26	4000	11/29	10	2.4	4.3	0.0	--
			12/30	38	7.1	12.2	7.3	--
Grass Mtn No. 2	21B27	2900	11/29	8	1.3	4.4	0.0	--
Grass Mtn No. 3	21B28	2100	11/29	0	0.0	0.0	0.0	--
Lester Creek	21B29	3100	11/29	12	1.6	3.8	2.2	--
			12/31	38	7.1	13.1	8.0	--
Stampede Pass	21B10	3000	11/1	0	0.0	0.0	2.7	--
			11/15	0	0.0	1.1	5.5	--
			11/30	19	2.2	5.2	10.1	--
			12/14	12	3.4	12.1	13.9	--
			1/7	81	12.1	19.1	17.2	20.7*
			1/18	81	16.7	23.7	26.0	25.1*

\* Adjusted 1948-62 average

# Not directly on this drainage

+ Snow water equivalent estimated from aerial stadia observation



## APPENDIX 6

			SNOW COVER MEASUREMENT					
			1966	: P a s t   R e c o r d				
DRAINAGE BASIN			Date	Snow	Water	Water	Water	
and			of	Depth	Content:	Content:	Content	(In.)
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	:1965	1964	1948-62
Avg.								
Snow Surveys Made Prior to February 1 1966 (Cont.)								
GREEN RIVER (Cont.)								
Sawmill Ridge	21B31	4700	11/29	16	2.7	6.4	9.0	--
			12/31	40	7.9	--	15.8	--
Twin Camp	21B30	4100	11/29	7	1.8	4.2	3.3	--
			12/31	30	6.2	13.3	10.3	--
WHITE RIVER								
#Cayuse Pass	21C6	5300	1/1	115	25.6	--	--	--
White River Camp Gr	21C34	4000	12/31	53	10.3	New Course		
SKYKOMISH RIVER								
#Stevens Pass	21B1	4070	10/26	0	0.0	0.0	4.0	--
			11/12	0	0.0	1.8	7.5	--
			11/29	23	4.4	6.9	12.0	11.6*
			12/14	24	7.8	15.6	16.8	15.2*
			12/30	66	13.2	34.1	24.0	21.8*
			1/13	96	28.5	34.6	30.8	27.5*
SKAGIT RIVER								
#Panorama Dome	21A5	4300	1/13	150	53.9	45.8	49.7	--
BAKER RIVER								
Dock Butte +	21A11A	3800	11/24	25	7.5	--	--	--
			1/15	120	42.0	34.8	--	--
Easy Pass +	21A7A	5200	11/24	31	9.3	--	--	--
			1/15	210	73.5	--	--	--
Jasper Pass +	21A6A	5400	11/24	32	9.6	--	--	--
			1/15	170	59.5	--	--	--
Marten Lake +	21A9A	3600	11/24	24	7.2	--	--	--
			1/15	161	56.4	63.3	--	--
Mount Blum +	21A18a	5800	11/24	36	10.8	--	--	--
			1/15	147	51.4	52.2	--	--

\* Adjusted 1948-62 average

# Not directly on this drainage

+ Snow water equivalent estimated from aerial stadia observation





# APPENDIX 7

			SNOW COVER MEASUREMENT					
			1966		: P a s t R e c o r d			
DRAINAGE BASIN			Date	Snow	Water	: Water Content (In.)		
and			of	Depth	Content	: 1948-62		
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	: 1965	1964	Avg.

## Snow Surveys Made Prior to February 1, 1966 (Cont.)

### BAKER RIVER (Cont.)

#Panorama Dome	21A5	4300	1/13	150	53.9	45.8	49.7	--
Rocky Creek +	21A12A	2100	11/24	6	1.8	--	--	--
			1/15	116	40.6	32.8	--	--
Schreibers Meadow†	21A10A	3400	11/24	26	7.8	--	--	--
			1/15	119	41.6	45.5	--	--
S.F. Thunder Creek†	21A14A	2200	11/24	0	0.0	--	--	--
			1/15	63	22.0	19.2	--	--
Watson Lakes +	21A8A	4500	11/24	26	7.8	--	--	--
			1/15	136	47.6	43.3	--	--

### NOOKSACK RIVER

Panorama Dome	21A5	4300	1/13	150	53.9	45.8	49.7	--
---------------	------	------	------	-----	------	------	------	----

# Not directly on this drainage

+ Snow water equivalent estimated from aerial stadia observation





## APPENDIX 8

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	Date of Survey	SNOW COVER MEASUREMENT				
				1966	: P a s t   R e c o r d			
				Snow Depth (In.)	Water Content: (In.)	Water Content (In.)	1948-62 Avg.	

U P P E R   C O L U M B I A   D R A I N A G EP E N D   O R E I L L E   R I V E R

Benton Meadow	16A2	2344	1/31	24	6.7	8.9	7.6	5.6
Benton Spring	16A3	4900	1/31	46	14.1	15.7	14.2	14.7
#Chewelah	17A4	4925	1/26	54	16.9	18.5	13.8	--
Lookout	15B2	5250	1/31	71	21.6	27.7	26.7	26.4
Nelson	Canada	3050	1/31	56	13.9	13.2	14.9	12.0
Schweitzer Bowl	16A6	4500	1/28	74	21.3	23.3	27.4	--
Schweitzer Ridge	16A5	6100	1/28	92	29.2	38.3	34.0	--
Winchester Creek	17A3	2970	1/28	37	9.8	14.0	11.0	9.9*

K E T T L E   R I V E R

Boulder Road	18A2	1450	1/27	20	5.6	7.1	5.3	--
Butte Creek	18A3	4070	1/27	25	7.4	9.7	6.9	--
Cabin Creek	18A8	3170	1/27	22	5.6	9.4	5.6	--
Carmi	Canada	4100	2/1	20	3.5	10.4	6.0	--
Farron	Canada	4000	1/31	41	10.7	13.5	11.3	10.1
Goat Creek	18A4	3595	1/27	21	5.5	8.2	5.5	--
Monashee Pass	Canada	4500	1/31	42	10.9	9.7	9.5	9.3**
Old Glory Mountain	Canada	7000	2/1	67	17.5	24.0	24.6	17.6**
Snow Caps Creek	18A5	2150	1/27	18	4.8	7.2	5.1	--
Snow Caps Trail	18A6	2720	1/27	20	5.2	7.2	5.2	--
Summit G.S.	18A7	4600	1/27	23	6.5	9.3	6.4	--

C O L V I L L E   R I V E R

Baird	17A6	3215	1/26	26	6.1	8.6	6.6	--
Carlson	18A9	2885	1/31	20	5.1	6.6	5.0	--
Chewelah	17A4	4925	1/26	54	16.9	18.5	13.8	--
Stanger Mountain	17A5	4990	1/27	44	13.0	16.0	13.6	--
Togo	18A10	3370	1/28	37	11.1	14.7	10.8	--

# Not located directly on this drainage

\* Adjusted 1948-62 average

\*\* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation





# APPENDIX 9

DRAINAGE BASIN and SNOW COURSE			SNOW COVER MEASUREMENT					
			1966		: P a s t		R e c o r d	
			Date of Survey	Snow Depth (In.)	Water : Content: (In.)	1965	1964	1948-62 Avg.
No.	Elev.							
<u>SPOKANE RIVER</u>								
Forty-nine Meadows +	15B3A	5000	1/29	70	21.3	28.0	26.6	--
4th of July Summit	16B3	3100	2/1	28	8.3	8.9	10.9	--
Granite Peak +	15B13A	6000	1/30	93	28.3	40.9	30.1	--
#Lookout	15B2	5250	1/31	71	21.6	27.7	26.7	26.4
Lost Lake +	15B14A	6000	1/30	92	28.0	49.1	34.3	--
Medicine Ridge +	15B4A	6150	1/30	115	35.0	46.4	35.3	--
Outlaw +	15B12A	3750	1/29	42	12.14	11.6	15.6	--
Sherwin	16C1	3200	1/29	38	10.0	12.4	14.1	--
<u>OKANOGAN RIVER</u>								
Aberdeen Lake	Canada	4300	1/31	23	6.3	5.7	4.6	4.8**
Blackwall Mountain	Canada	6250	1/31	72	25.2	24.8	31.6	21.8**
Brookmere	Canada	3200	1/30	28	8.0	6.3	10.2	7.2**
Clark	19A8a	7000	Not Measured		--	16.1	--	--
Copper Mountain	Canada	4300	Not Measured		--	6.1	5.3**	--
Enderby	Canada	6250	1/24	82	20.9	19.9	13.7	--
Hamilton Hill	Canada	4900	1/29	42	13.1	--	11.3	8.6**
#Harts Pass	20A5A	6500	1/27	78	26.0	30.8	36.9	31.1*
#Horseshoe Basin +	19A5a	7000	Not Measured		--	12.0	--	--
Lost Horse Mountain	Canada	6300	1/31	19	4.6	5.5	7.9	6.0**
#Loup Loup	19A7	4650	1/27	26	6.1	8.0	6.8	--
McCulloch	Canada	4200	1/29	21	4.6	5.2	5.8	5.0
Missezula Mountain	Canada	5100	1/31	28	7.5	5.4	7.4	5.6**
Mission Creek	Canada	6000	1/29	43	10.5	14.3	14.4	11.8**
Monashee Pass	Canada	4500	1/31	42	10.9	9.7	9.5	9.3**
Muckamuck +	19A9a	6390	Not Measured		--	11.3	--	--
Mutton Creek No. 1	19A1	5700	1/26	35	9.7	10.0	7.2	9.6*
Mutton Creek No. 2	19A4	6000	1/26	33	9.4	11.2	11.6	10.0*
New Copper Mountain	Canada	4300	1/30	23	5.6	5.9	6.6	5.2**
Paysayten +	20A28a	4300	Not Measured		--	15.6	15.0	--
Postill Lake	Canada	4500	1/28	25	5.8	5.7	--	5.7**
Rusty Creek	19A3	4000	1/31	25	6.7	5.8	5.3	6.0
Salmon Meadows	19A2	4500	1/26	26	6.0	9.0	9.2	7.7*
Silver Star Mtn.	Canada	6050	1/31	60	16.6	16.0	11.6	14.2**
Starvation Mtn. +	19A10a	6750	Not Measured		--	16.6	--	--
Summerland Reservoir	Canada	4200	1/26	28	6.5	--	8.5	--
Touts Coulee	19A6	2845	1/27	15	3.1	4.2	3.6	--
Trout Creek	Canada	4700	2/1	28	5.5	5.7	6.3	5.7

# Not located directly on this drainage

\* Adjusted 1948-62 average

\*\* Average for years of record

+ Snow water equivalent estimated from aerial stadia observation





# APPENDIX 10

			SNOW COVER MEASUREMENT					
			1966		: P a s t R e c o r d			
DRAINAGE BASIN and SNOW COURSE	No.	Elev.	Date of Survey	Snow Depth (In.)	Water Content: (In.)	Water Content : 1965	1964	(In.) 1948-62 Avg.
<u>METHOW RIVER</u>								
Billy Goat Pass +	20A10a	6400	Not Measured			23.4	23.8	--
Dollar Watch +	20A29a	7000	Not Measured			18.7	20.2	--
Harts Pass	20A5A	6500	1/27	78	26.0	30.8	36.9	31.1*
Horseshoe Basin +	19A5a	7000	Not Measured			--	12.0	--
Loup Loup	19A7	4650	1/27	26	6.1	8.0	6.8	--
#Mutton Creek No. 1	19A1	5700	1/26	35	9.7	10.0	7.2	9.4*
#Mutton Creek No. 2	19A4	6000	1/26	33	9.4	11.2	11.6	10.0*
#Rusty Creek	19A3	4000	1/31	25	6.7	5.8	5.3	6.0
#Salmon Meadows	19A2	4500	1/26	26	6.0	9.0	9.2	7.7*
War Creek Pass +	20A3a	6500	Not Measured			New Aerial Marker		
<u>CHELAN LAKE BASIN</u>								
Cloudy Pass +	20A22a	6500	Not Measured			29.0	23.0	29.7*
Greenwood Flat +	20A25a	3540	Not Measured			20.0	24.2	23.6*
Little Meadows +	20A24a	5275	Not Measured			30.7	27.5	31.6*
Lyman Lake +	20A23A	5900	Not Measured			37.7	32.5	--
Park Creek Flat +	20A13a	2220	Not Measured			27.8	25.2	--
Park Creek Ridge +	20A12A	4600	Not Measured			33.9	34.5	--
Petersons +	20A16a	3730	Not Measured			28.4	21.0	--
Rainy Pass	20A9	4780	1/28	76	24.3	28.9	28.3	29.8*
Safety Harbor +	20A30A	6300	Not Measured			24.1	--	--
War Creek Pass +	20A31a	6500	Not Measured			New Aerial Marker		
<u>ENTIAT RIVER</u>								
Brief	20B19	1600	1/30	31	6.8	8.6	7.5	--
Entiat Meadows +	20A33a	4800	Not Measured			New Aerial Marker		
Entiat River Tr. +	20A34a	3150	Not Measured			New Aerial Marker		
Pope Ridge	20B20	4300	1/31	53	14.4	New Course		
Pugh Ridge +	20A32a	6400	Not Measured			New Aerial Marker		
Snow Brushy +	20A35a	3850	Not Measured			New Aerial Marker		
Tommy Creek +	20B21a	5300	Not Measured			New Aerial Marker		
<u>WENATCHEE RIVER</u>								
Berne-Mill Creek	21B23	2925	1/28	52	17.8	24.7	26.8	--
Blewett Pass No. 2	20B2	4270	1/28	44	12.7	18.0	14.3	12.4*
Chiwaukum G. S.	20B16	1810	1/28	33	8.4	14.4	10.9	--
Lake Wenatchee	20B5	1970	1/28	36	10.6	15.4	15.4	--

# Not directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation







## APPENDIX 11

			SNOW COVER MEASUREMENTS					
			1966		: P a s t   R e c o r d			
DRAINAGE BASIN and SNOW COURSE	No.	Elev.	Date of Survey	Snow Depth (In.)	Water Content: (In.)	Water Content: (In.)	1948-62 Avg.	
<u>WENATCHEE RIVER (Cont.)</u>								
Leavenworth R. S.	20B17	1127	1/26	25	7.3	8.1	6.7	--
#Lyman Lake	20A23A	5900	Not Measured			37.7	32.5	--
Merritt	20B18	2140	1/28	41	13.4	18.6	18.4	--
Stevens Pass	21B1	4070	1/28	94	31.2	44.6	48.9	34.9
<u>SQUILCHUCK CREEK</u>								
Beehive Springs	20B3	4400	1/26	29	7.7	7.1	6.9	5.5*
Scout-A-Vista	20B4	3400	1/26	29	7.0	7.8	6.3	6.1*
<u>STEMILT CREEK</u>								
Jump-Off	20B8	4450	1/27	28	8.0	7.4	6.4	--
Stemilt Slide	20B6	5000	1/27	39	12.0	11.7	10.7	--
Upper Wheeler	20B7	4400	1/27	32	9.0	9.9	9.0	--
<u>YAKIMA RIVER</u>								
Ahtanum R. S.	21C11	3100	1/30	33	8.1	10.1	4.7	6.5*
#Blewett Pass No.2	20B2	4270	1/28	44	12.7	18.0	14.3	12.4*
Bumping Lake	21C8	3450	1/28	47	14.4	17.9	15.2	13.5
#Cayuse Pass	21C6	5300	2/1	143	53.3	63.9	81.6	60.3*
Clockum Pass	20B9	5370	Not Measured					
Cooke Creek	20B10	4123	2/1	26	7.3	--	--	--
Grouse Camp	20B11	5385	1/31	49	12.6	--	--	--
High Creek	20B12	2930	2/2	26	6.9	6.6	6.0	--
Lake Cle Elum	21B14M	2200	1/29	26	8.4	12.2	14.2	8.9
Manashtash	20C1	3935	2/2	16	4.5	4.9	5.1	--
Morse Lake	21C17	5400	1/27	103	32.4	45.4	47.0	39.8*
Nanum	20B13	3875	1/31	37	10.3	--	--	--
#Olallie Meadows	21B2	3625	1/31	93	33.0	45.3	45.6	30.1*
#Satus Pass	20D1	4030	1/31	49	17.1	14.6	9.5	--
#Stampede Pass	21B10	3000	1/28	82	18.0	37.7	33.9	33.6*
Trail Creek	20B14	3360	2/1	20	5.4	--	--	--
Tunnel Avenue	21B8	2450	1/29	50	17.3	24.8	27.9	18.7
Walters Flat	20B15	3360	2/2	30	8.1	8.5	6.6	--
White Pass (E Side)	21C28	4500	1/31	54	16.1	24.3	20.1	18.5*
White Pass (Leech L)	21C27	4500	1/31	66	21.6	29.2	29.0	--
<u>AHTANUM CREEK</u>								
Ahtanum R. S.	21C11	3100	1/30	33	8.1	10.1	4.7	6.5*

# Not directly on this drainage

\* Adjusted 1948-62 average





## APPENDIX 12

				SNOW COVER MEASUREMENT				
				1966	: P a s t   R e c o r d			
DRAINAGE BASIN			Date	Snow	Water	Water	Water	
and			of	Depth	Content:	Content:	Content	(In.)
SNOW COURSE	No.	Elev.	Survey	(In.)	(In.)	:1965	1964	1948-62
								Avg.
<u>L O W E R   C O L U M B I A   D R A I N A G E</u>								
<u>ASOTIN CREEK</u>								
Spruce Springs	17C4	5700	1/27	50	15.7	24.6	--	--
<u>MILL CREEK</u>								
Homestead	17C1	4630	1/28	32	9.4	8.9	8.4	7.0*
Martin Springs	17C2	4400	1/28	40	12.0	13.2	12.6	8.3*
Walla Walla Div.	18D13	2400	1/26	16	4.0	2.0	4.9	2.0*
<u>KLICKITAT RIVER</u>								
Satus Pass	20D1	4030	1/31	49	17.1	14.6	9.5	--
West Fork Cabin	21C15	3000	1/29	41	14.7	18.1	8.3	--
<u>WHITE SALMON RIVER</u>								
Cultus Creek	21C12	4000	1/27	95	36.2	39.9	35.5	30.1*
#Surprise Lakes	21C13A	4250	1/27	102	37.8	43.0	43.5	32.8*
<u>WIND RIVER</u>								
Oldman Pass	21D19	3100	1/26	68	27.8	25.4	14.8	--
<u>LEWIS RIVER</u>								
Blue Lake +	21C22a	4800	1/28	155	57.3	62.8	69.1	--
Bob's Trail	21C21	2200	1/27	52	20.6	18.8	14.3	--
Calamity Ridge +	22D1a	2500	1/28	31	12.4	4.8	2.8	--
Council Pass +	21C18a	4200	1/28	90	33.3	34.0	40.3	--
#Cultus Creek	21C12	4000	1/27	95	36.2	39.9	35.5	30.1*
Divide Meadow +	21C29a	5600	1/28	101	36.3	48.4	49.0	--
Grand Meadow	21C25	3500	1/28	61	22.3	26.6	18.8	--
Lone Pine Shelter	21C26	3800	1/28	89	36.4	38.0	30.3	--
Marble Mountain +	22C5a	3200	1/28	72	30.3	21.6	27.6	--
#Mosquito Meadows	21C19	4100	1/28	93	36.9	41.3	34.3	--
New Muddy River	22C16	2000	1/29	42	20.0	19.2	11.2	--

# Not located directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation





## APPENDIX 13

DRAINAGE BASIN and SNOW COURSE	No.	Elev.	SNOW COVER MEASUREMENT						
			Date of Survey	1966 Snow Depth (In.)	Water Content: (In.)	: P a s t   R e c o r d			1948-62 Avg.
						Water	Water	Content	
						:1965	1964	(In.)	

LEWIS RIVER (Cont.)

Oldman Pass	21D19	3100	1/26	68	27.8	25.4	14.8	--	
Smith Creek Road	22C4	2100	1/29	55	25.7	30.1	11.1	--	
Spencer Meadow +	21C20a	3400	1/28	78	29.6	18.4	23.3	9.4*	
Surprise Lakes	21C13A	4250	1/27	102	37.8	43.0	43.5	32.8*	
Table Mountain +	21C24a	4200	1/28	97	36.8	40.4	43.9	--	
Timbered Peak +	21D18a	3000	1/28	60	24.6	12.0	13.7	--	

COWLITZ RIVER

Cayuse Pass	21C6	5300	2/1	143	53.3	63.9	81.6	60.3*	
Mosquito Meadows	21C19	4100	1/28	93	36.9	41.3	34.3	--	
Ohanapecosh	21C32	2200	1/31	44	16.0	20.8	16.6	--	
Packwood Lake	21C31	2870	1/27	35	13.6	14.8	7.8	--	
Pigtail Peak	21C33	5900	1/31	113	40.2	59.0	56.2	--	
Potato Hill	21C14	4500	1/29	70	26.1	29.9	23.0	19.7*	
#White Pass (E Side)	21C28	4500	1/31	54	16.1	24.3	20.1	18.5*	
#White Pass (Leech L)	21C27	4500	1/31	66	21.6	29.2	29.0	--	
Willame Creek	21C30	3250	1/26	70	24.6	28.5	24.9	--	

P U G E T   S O U N D   D R A I N A G ENISQUALLY RIVER

Ghost Forest	21C4	4550	1/28	83	31.3	37.3	41.0	30.6*	
Longmire	21C3	2760	1/28	28	8.8	13.8	12.3	9.5*	
New Paradise Park	21C35	5500	1/28	105	39.2	New Course			
Stem Glade	21C1	5050	1/28	111	39.8	56.2	58.6	48.4*	

WHITE RIVER

#Cayuse Pass	21C6	5300	2/1	143	53.3	63.9	81.6	60.3*	
#Morse Lake	21C17	5400	1/27	103	32.4	45.4	47.0	39.8*	
White R. Camp Gr.	21C34	4000	2/1	63	21.8	New Course			

GREEN RIVER

Airstip	21B24	1800	1/24	26	7.2	7.2	10.2	--	
Charley Creek	21B25	1200	1/24	14	4.3	0.0	3.2	--	
Grass Mtn. No. 1	21B26	4000	1/24	48	17.0	17.0	21.2	--	
Grass Mtn. No. 2	21B27	2900	1/24	50	17.8	18.5	20.8	--	

# Not directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation





## APPENDIX 14

DRAINAGE BASIN and SNOW COURSE			SNOW COVER MEASUREMENT					
			1966		: P a s t   R e c o r d			
			Date	Snow	Water	: Water Content (In.)		
			of	Depth	Content:	1948-62		
No.	Elev.	Survey	(In.)	(In.)	:1965	1964	Avg.	
<u>GREEN RIVER (Cont.)</u>								
Grass Mtn. No. 3	21B28	2100	1/24	20	6.2	3.7	0.0	--
Lester Creek	21B29	3100	1/24	55	15.6	19.8	20.6	--
Sawmill Ridge	21B31	4700	1/24	69	20.3	32.6	35.2	--
Stampede Pass	21B10	3000	1/28	82	18.0	37.7	33.9	33.6*
Twin Camp	21B30	4100	1/24	48	14.8	26.0	25.8	--
<u>SNOQUALMIE RIVER</u>								
Olallie Meadows	21B2	3625	1/31	93	33.0	45.3	45.6	30.1*
<u>SKAGIT RIVER</u>								
#Cloudy Pass	20A22A	6500	Not Measured			29.0	23.0	29.7*
Devils Park	20A4	5900	1/27	80	26.5	29.7	36.0	31.9*
#Harts Pass	20A5A	6500	1/27	78	26.0	30.8	36.9	31.1*
Klesilkwa	Canada	3700	Late Report			8.6	11.2	10.7**
#Lyman Lake	20A23A	5900	Not Measured			37.7	32.5	--
New Tashme	Canada	2500	2/1	33	10.7	10.2	10.2	7.8
#Panorama Dome	21A5	4300	1/26	146	51.5	53.8	77.6	--
#Rainy Pass	20A9	4780	1/28	76	24.3	28.9	28.3	29.8*
<u>BAKER RIVER</u>								
Dock Butte +	21A11A	3800	2/1	131	45.8	40.3	--	--
Easy Pass +	21A7A	5200	2/1	149	52.2	48.0	--	--
Jasper Pass +	21A6A	5400	2/1	160	56.0	59.3	79.3	--
Marten Lake +	21A9A	3600	2/1	164	57.4	60.0	64.5	--
Mount Blum +	21A8a	5800	2/1	158	55.3	60.0	--	--
#Panorama Dome	21A5	4300	1/26	146	51.5	53.8	77.6	--
Rocky Creek +	21A12A	2100	2/1	64	22.4	28.0	22.2	--
Schreibers Meadow +	21A10A	3400	2/1	105	36.8	41.8	57.3	--
S. F. Thunder Cr. +	21A14A	2200	2/1	38	13.3	10.1	7.9	--
Watson Lakes +	21A8A	4500	2/1	140	49.0	46.7	54.4	--

# Not directly on this drainage

\* Adjusted 1948-62 average

+ Snow water equivalent estimated from aerial stadia observation



# APPENDIX 15

				SNOW COVER MEASUREMENTS				
				1966	: P a s t R e c o r d			
DRAINAGE BASIN and SNOW COURSE	No.	Elev.	Date of Survey	Snow Depth (In.)	Water : Content: (In.)	Water Content (In.)	1946-62	
						: 1965	1964	Avg.
<u>NOOKSACK RIVER</u>								
Panorama Dome	21A5	4300	1/26	146	51.5	53.8	77.6	--
<u>O L Y M P I C P E N I N S U L A</u>								
<u>DUNGENESS RIVER</u>								
Deer Park	23B4	5200	1/31	56	18.3	14.9	14.7	18.0*
<u>MORSE CREEK</u>								
Deer Park G. S.	23B13	4850	1/31	46	14.8	14.1	--	--
Morse Creek	23B12	5425	1/27	95	32.6	29.5	34.4	--
<u>ELWHA RIVER</u>								
Hurricane	23B3	4500	1/27	55	17.0	18.9	26.4	--
<u>SKOKOMISH RIVER</u>								
Black & White	23B7	4200	1/28	83	33.5	32.8	41.8	--
Black & White Lakes	23B6	4700	1/28	109	45.9	38.5	52.0	40.0*
Four Stream	23B10	3000	1/28	56	24.4	26.4	25.0	--
Home Sweet Home	23B5	5200	1/28	140	52.7	47.8	75.0	--
Sundown Pass	23B8	3900	1/28	104	44.1	42.4	50.5	--

\* Adjusted 1948-62 average





# Agencies Assisting with Snow Surveys

## GOVERNMENT AGENCIES

### Canada:

Department of Lands, Forests and Water Resources,  
Water Resources Service, British Columbia

### States:

Washington State Department of Conservation  
Washington State Department of Natural Resources

### Federal:

Department of the Army  
Corps of Engineers  
U. S. Department of Agriculture  
Forest Service  
U. S. Department of Commerce  
Weather Bureau  
U. S. Department of the Interior  
Bonneville Power Administration  
Bureau of Reclamation  
Geological Survey  
National Park Service

## PUBLIC AND PRIVATE UTILITIES

Chelan County P.U.D.  
Pacific Power and Light Company  
Puget Sound Power and Light Company  
Washington Water Power Company

## OTHER PUBLIC AGENCIES

Okanogan Irrigation District  
Wenatchee Heights Irrigation District

## MUNICIPALITIES

City of Walla Walla  
City of Tacoma  
City of Seattle

*Other organizations and individuals furnish valuable information for snow survey reports. Their cooperation is gratefully acknowledged.*

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